TRENDS IN GENETICS REFERENCE EDITION

Volume 8 1992

CONTENTS

JANUARY

COMMENT

Mutants shed light on plant development, *by Eduardo R. Bejarano and Conrad Lichtenstein* 1
Barley genetics – not only here for the beer, *by Bengt O. Bengtsson* 3

TECHNICAL TIPS

• Freezing ES cells • Hot STSs • Diaminobenzidine disposal 6

LETTERS

Nonradioactive *in situ* hybridization with digoxigenin, *by Jonathan L. Rees and Christine Fisher (with reply by Diethard Tautz)* 8

MONITOR

• Nematode cell death • TFIIB function • *Zfy* fusion gene • Yeast signal recognition particle
• Kallmann's syndrome gene • Boundaries of active chromatin • New MHC class II genes 10

TECHNICAL FOCUS

Cloning high molecular weight DNA fragments by the bacteriophage P1 system, *by Nat L. Sternberg* 11

REVIEWS

Wilms' tumour: reconciling genetics and biology, *by Veronica van Heyningen and Nicholas D. Hastie* 16
Plant transcription factors: present knowledge and future challenges, *by Fumiaki Katagiri and Nam-Hai Chua* 22
Conservation and evolution of transcriptional mechanisms in eukaryotes, *by Leonard Guarente and Olivia Bermingham-McDonogh* 27
Mitotic gold in a mold: *Aspergillus* genetics and the biology of mitosis, *by N. Ronald Morris and Annmarie Pallone Enos* 32

BOOK REVIEWS

Postimplantation Mammalian Embryos: A Practical Approach (A.J. Copp and D.L. Cockroft, eds), *by Gregory R. Dressler* 37
Developmental Biology (3rd edn) (S.F. Gilbert), *by Claudio D. Stern* 38
From Gene to Animal (2nd edn) (D. de Pomerai), *by H.R. Woodland* 38
From Egg to Embryo (2nd edn) (J.M.W. Slack), *by Rosa Beddington* 39
Molecular and Cellular Basis of Pattern Formation (*Development* 1991 Suppl.) (E. Coen *et al.*, eds), *by Michael Freeling* 39
DNA Science – A First Course in Recombinant DNA Technology (D.A. Micklos and G.A. Freyer), *by Christopher J. Howe* 40

ERRATUM

Boundary functions in the control of gene expression, *by J.C. Eissenberg and S.C.R. Elgin (TIG 7, 335–340)* 9

FEBRUARY

COMMENT

Toward a transcriptional map of the human genome, *by Ute Hochgeschwender* 41
A digital DNA dipstick for probing human diversity, *by Gabriel A. Dover* 45

TECHNICAL TIPS

• Locating mutant genes • Nonisotopic SSCP detection 48

MONITOR

• DNA hairpins • *C. elegans* transformation • *E. coli* σ factors • *Xenopus* axis formation
• Homeobox oncogene • Heat shock factor oligomerization 50

Technical Focus

Molecular sequence accuracy: analysing imperfect data, *by David J. States* 52

Reviews

The secret life of the hair follicle, *by Margaret H. Hardy* 55
Src-related protein tyrosine kinases and T-cell receptor signalling, *by André Veillette and Dominique Davidson* 61
Extracellular proteins in plant embryogenesis, *by Fred A. van Engelen and Sacco C. de Vries* 66
Towards a *Drosophila* genome map, *by Daniel L. Hartl, James W. Ajioka, Haini Cai, Allan R. Lohe, Elena R. Lozovskaya, David A. Smoller and Ian W. Duncan* 70

Book Reviews

Nuclear Hormone Receptors: Molecular Mechanisms, Cellular Functions, Clinical Abnormalities (M.G. Parker, ed.), *by Bernd Groner* 76
The Hormonal Control of Gene Transcription (Molecular Aspects of Cellular Regulation Vol. 6) (P. Cohen and J.G. Foulkes, eds), *by Rainer Renkawitz* 76
Molecular Biology Labfax (T.A. Brown, ed.), *by Steve Busby* 77
Plant Cell and Tissue Culture (A. Stafford and G. Warren, eds), *by David A. Evans* 78
Gene-Mapping Techniques and Applications (L.B. Schook, H.A. Lewin and D.G. McLaren, eds), *by Anna-Maria Frischauf* 78

Erratum

Signal transduction in yeast mating: Receptors, transcription factors and the kinase connection, *by George F. Sprague (TIG 7, no. 11/12, 393–398)* 49

March

Comment

Parallel pathways of cell cycle-regulated gene expression, *by Noel F. Lowndes and Leland H. Johnston* 79

Technical Tips

• DNA recovery from agarose • Polyacrylamide–agarose gels for fingerprinting 81

Monitor

• Yeast MCM1 function • *deficiens* expression in *Antirrhinum* • *runt* and neural development
• More activin receptors • Sex chromosome evolution • Fungal 'B' chromosome gene
• Gene targeting in *C. elegans* 83

Reviews

New insights into genetic eye disease, *by A.F. Wright* 85
A new bind for Myc, *by George C. Prendergast and Edward B. Ziff* 91
The BMP proteins in bone formation and repair, *by Vicki Rosen and R. Scott Thies* 97
Retroelements in higher plants, *by Marie-Angèle Grandbastien* 103
Unraveling the knots in plant development, *by Sarah Hake* 109

Book Reviews

The ACT Cytogenetics Laboratory Manual (2nd edn) (M.J. Barch, ed.), *by A.T. Sumner* 115
Chromosomal Aberrations: Basic and Applied Aspects (G. Obe and A.T. Natajarian, eds), *by Feyruz Rassool and Richard Gatti* 115
Advanced Techniques in Chromosome Research (K.W. Adolf, ed.), *by Howard Cooke* 116
Catalog of Chromosome Aberrations in Cancer (4th edn) (F. Mitelman), *by T.H. Rabbitts* 117
Classic Experiments in Modern Biology (M.H. Green), *by J. Paul Luzio* 117
Transdifferentiation: Flexibility in Cell Differentiation (T.S. Okada), *by Jeremy Brockes* 118

April

Comment

Mouse mutations and human disorders are Paired, *by Robert Hill and Veronica van Heyningen* 119

Technical Tips

• Purification and amplification of poly(A)$^+$ mRNA 121

Monitor

• YAC transfection of mammalian cells • *Drosophila* salivary gland development
• DMD and autosomal disease genes • Prion disease • Transcription topology
• *RAD14* and human DNA repair genes • Modulating cell adhesion 122

Perspectives

Temporal regulation in the early embryo: is MBT too good to be true?
by Glenn K. Yasuda and Gerold Schubiger 124

Small repeated sequences and the structure of plant mitochondrial genomes,
by C. André, A. Levy and V. Walbot 128

Reviews

Hormones, puffs and flies: the molecular control of metamorphosis by ecdysone,
by Andrew J. Andres and Carl S. Thummel 132

The molecular basis of glucose-6-phosphate dehydrogenase deficiency, *by Tom Vulliamy, Philip Mason and Lucio Luzzatto* 138

Making muscle in mammals, *by Margaret Buckingham* 144

Book Reviews

Aging, Sex, and DNA Repair (C. Bernstein and H. Bernstein), *by Alexey S. Kondrashov* 149

Longevity, Senescence, and the Genome (C.E. Finch), *by Philip M. Service* 150

MAY

Comment

Insistent and intransigent: a phage Mu enhancer functions *in trans*, *by Martin R. Boocock, Sally-J. Rowland, W. Marshall Stark and David J. Sherratt* 151

Letters

Homeodomains and regulation of sexual development in basidiomycetes, *by Ursula Kües and Lorna A. Casselton* 154

Monitor

• Synapse specificity in *C. elegans* • Antigen presentation • *Sex-lethal* expression
• Genetic resource preservation • Exon shuffling • Cell ablation • p53 in yeast cells 156

Perspectives

Mesoderm induction and development of the embryonic axis in amniotes, *by Claudio D. Stern* 158

Reviews

Molecular genetics of sex determination in *C elegans*, *by Patricia E. Kuwabara and Judith Kimble* 164

X-chromosome inactivation and cell memory, *by Arthur D. Riggs and Gerd P. Pfeifer* 169

Ustilago maydis, the delightful blight, *by Flora Banuett* 174

The retinoblastoma protein and cell cycle regulation, *by P.A. Hamel, B.L. Gallie and R.A. Phillips* 180

Book Reviews

The Early Development of *Xenopus laevis*: An Atlas of the Histology (P. Hausen and M. Riebesell), *by H. Joseph Yost* 186

JUNE

Comment

Hotspots and warm spots: integration specificity of retroelements, *by Robert Craigie* 187

Technical Tips

• Simultaneous isolation of nuclear and cytoplasmic RNA 190

Monitor

• *DMD* in a YAC • *decapentaplegic* and the dorsoventral axis • Controlling *Krüppel* expression
• Fas, apoptosis and *lpr* mice • Conditional mutations • *C. elegans* signal transduction gene *sem-5*
• Human prohibitin 191

Perspectives

Telomere positional effects and the regulation of cellular senescence, *by Woodring E. Wright and Jerry W. Shay* 193

Genetics and Society

Genetic testing in the workplace: a view from the USA, *by Paul Billings and Jon Beckwith* 198

Reviews

Patterning of the *Drosophila* nervous system: the *achaete-scute* gene complex, *by Sonsoles Campuzano and Juan Modolell* 202
Developmental choices in mating-type interconversion in fission yeast, *by Amar J.S. Klar* 208
Models of plant–pathogen coevolution, *by S.A. Frank* 213

Book Reviews

PCR: A Practical Approach (M.J. McPherson, P. Quirke and G.R. Taylor, eds), *by John Bell* 220
The Making of a Fly: The Genetics of Animal Design (P.A. Lawrence), *by P.W. Ingham* 220
Molecular Biology and Biotechnology (Molecular and Cell Biochemistry Series) (C.A. Smith and E.J. Wood) *and* Molecular Genetics: A Workbook (P. Smith-Keary), *by Christopher Howe* 221

July

Comment

Axis determination in sea urchin embryos: from confusion to evolution, *by William R. Jeffery* 223

Technical Tips

• Magnetic isolation of mRNA • Preparing high molecular weight DNA
• DMSO and PCR amplification 225

Letters

Inositol phospholipids in plant cell signalling, *by Kregg J. Einspahr* 228
Reply, *by A. Trewavas* 228
Spontaneous generation of enhancers by point mutations? *by William F. Loomis and Adam Kuspa* 229

Monitor

• Hydra homeobox genes • Reindeer and the aftermath of Chernobyl • *ste6* and *mdr*
• Ras signalling • Uniparental isodisomy of chromosome 21 • RAP-1-interacting protein
• RNA import into mitochondria • *Min* and *APC* 230

Reviews

Anatomy of an enhancer, *by Catherine C. Thompson and Steven L. McKnight* 232
The *Wnt* family of developmental regulators, *by Andrew P. McMahon* 236
Knowing your neighbors: Cell interactions determine intrasegmental patterning in *Drosophila*, *by Mark Peifer and Amy Bejsovec* 243
Fragile X syndrome: The molecular picture comes into focus, *by Robert I. Richards and Grant R. Sutherland* 249
Myotonic dystrophy, *by Allen D. Roses* 254

Book Reviews

Xenopus laevis: Practical Uses in Cell and Molecular Biology (Methods in Cell Biology Vol. 36) (B.K. Kay and H.B. Peng, eds), *by A. Colman* 256
Molecular and Cellular Approaches to the Control of Proliferation and Differentiation (G.S. Stein and J.B. Lian, eds), *by J.R. Woodgett* 256
The Molecular and Cellular Biology of the Yeast *Saccharomyces*: Genome Dynamics, Protein Synthesis, and Energetics (Cold Spring Harbor Laboratory Press Monograph 21A) (J.R. Broach, J.R. Pringle and E.W. Jones, eds), *by Merl F. Hoekstra* 257
The Molecular Fabric of Cells (R.D.J. Barker and C.K. Leach) *and* Cell Biology (Molecular and Cell Biochemistry Series) (C.A. Smith and E.J. Wood), *by J.P. Luzio* 258
Essential Molecular Biology (Vols 1 and 2) (T.A. Brown, ed.), *by Chris Boyd* 258

Functional Organization of the Nucleus: A Laboratory Guide (Methods in Cell Biology Vol. 35) (B.A. Hamkalo and S.C.R. Elgin, eds), *by Steven Henikoff* 259

AUGUST

Comment

Sex variations, *by C.P. Kyriacou* 261

Technical Tips

• Detection of rare mRNAs via quantitative RT-PCR 263

Letters

Regulation of mitochondrial gene expression: transcription versus replication, *by Rudolf J. Wiesner* 264
Reply, *by Phillip Nagley* 265

Monitor

• *Evx* expression in mouse • Effects of Ty on fitness • Interactions between maize regulatory proteins • GAL4–GAL80 interactions • pp125^{FAK} • Introns in bacterial tRNA genes • *fem*-3 regulation 266

Reviews

Sex, light and carotenes: the development of *Phycomyces*, *by Luis M. Corrochano and Enrique Cerdá-Olmedo* 268
Cell polarity and cell diversification during early mouse embryogenesis, *by Catherine Gueth-Hallonet and Bernard Maro* 274
Continuous conversion of neuron phenotype in hydra, *by Hans R. Bode* 279
The TATA-binding protein: a central role in transcription by RNA polymerases I, II and III, *by Robert J. White and Stephen P. Jackson* 284
Microsatellites for linkage analysis of genetic traits, *by Catherine M. Hearne, Soumitra Ghosh and John A. Todd* 288

Book Reviews

Evolutionary Developmental Biology (B.K. Hall), *by Jonathan Slack* 294
Molecular Genetic Analysis of Populations: A Practical Approach (A.R. Hoelzel, ed.), *by Stephen A. Karl* 295

SEPTEMBER

Comment

Homeobox cooperativity, *by Robb Krumlauf and Alex Gould* 297

Technical Tips

• Optimized CAT assay • Wax for PCR 300

Reviews

Mapping the genes that made maize, *by John Doebley* 302
Master genes in mammalian repetitive DNA amplification, *by Prescott L. Deininger, Mark A. Batzer, Clyde A. Hutchison, III and Marshall H. Edgell* 307
Ordering gene function: the interpretation of epistasis in regulatory hierarchies, *by Leon Avery and Steven Wasserman* 312
Secretion across the bacterial outer membrane, *by Cécile Wandersman* 317
Regenerating good sense: RNA editing and *trans* splicing in plant mitochondria, *by Bernd Wissinger, Axel Brennicke and Wolfgang Schuster* 322

Book Reviews

Genetics and Evolution of the Domestic Fowl (L. Stevens), *by David T. Parkin* 328

OCTOBER

COMMENT

P element transposition and targeted manipulation of the *Drosophila* genome, *by John W. Sentry and Kim Kaiser* 329

TECHNICAL TIPS

• PCR sequencing • Bacterial DNA isolation 332

MONITOR

• p53 • Gastrulation and *goosecoid* • *Gart* locus evolution • Yeast meiotic recombination • *Drosophila emc* gene • A TFIID-associated protein in yeast 333

REVIEWS

Molecular genetic analysis of *Drosophila* rDNA arrays, *by Scott M. Williams and Leonard G. Robbins* 335
Insertional mutation of 'classical' and novel genes in transgenic mice, *by Miriam H. Meisler* 341
Centrepage diagram: Transgenic mutagenesis in the mouse, *by Rosa Beddington* 345
Embryonic lens induction: shedding light on vertebrate tissue determination, *by Robert M. Grainger* 349
Why is the genome variable? Insights from *Drosophila*, *by Charles F. Aquadro* 355

BOOK REVIEWS

Postimplantation Development in the Mouse (CIBA Foundation Symposia 165) (D.J. Chadwick and J. Marsh, eds), *by Ian J. Jackson* 362
Transgenic Animals (F. Grosveld and G. Kollias, eds), *by Cathy Abbott* 363

NOVEMBER

COMMENT

New insights into the mechanism of HIV-1 *trans*-activation, *by Jonathan Karn and Maria A. Graeble* 365
Plant genetics flourishes, *by Cathie Martin and Jonathan Jones* 368

TECHNICAL TIPS

• *Drosophila* DNA for PFGE • Reprobing after FISH 371

MONITOR

• *PAX6* and aniridia • Sequencing by oligonucleotide array hybridization • Link between receptor tyrosine kinases and RAS • Plant *cdc2* • *Drosophila Notch* functions • Mouse models for CF 374

REVIEWS

Eukaryotic replication origins as promoters of bidirectional DNA synthesis, *by N.H. Heintz, L. Dailey, P. Held and N. Heintz* 376
The *S* locus of flowering plants: when self-rejection is self-interest, *by Richard D. Thompson and Hans-Hubert Kirch* 381
Yeast SNF/SWI transcriptional activators and the SPT/SIN chromatin connection, *by Fred Winston and Marian Carlson* 387
The spectrum of cystic fibrosis mutations, *by Lap-Chee Tsui* 392
Mls genes and self-superantigens, *by Brigitte T. Huber* 399

DECEMBER

Special Issue: Programmed DNA Rearrangements

INTRODUCTION

Genetic switches: mechanism and function, *by R.H.A. Plasterk* 403

OBITUARY

Barbara McClintock – a personal view, *by Regine Kahmann* 407

Reviews

V(D)J recombination gets a break, *by Martin Gellert* 408
Activation of V(D)J recombination by *RAG1* and *RAG2, by Marjorie A. Oettinger* 413
Creation of immunoglobulin diversity by intrachromosomal gene conversion, *by Craig B. Thompson* 416
Genetic variation in pathogenic bacteria, *by Brian D. Robertson and Thomas F. Meyer* 422
Chromatin diminution in nematode development, *by Heinz Tobler, Adrian Etter and Fritz Müller* 427
Catalysis by site-specific recombinases, *by W. Marshall Stark, Martin R. Boocock and David J. Sherratt* (*see also* Erratum in *TIG*, February 1993) 432
The unusual organization and processing of genomic DNA in hypotrichous ciliates, *by David M. Prescott* 439
Mating-type gene switching in *Saccharomyces cerevisiae, by James E. Haber* 446
Antigenic variation in African trypanosomes, *by Lex H.T. Van der Ploeg, Keith Gottesdiener and Mary G-S. Lee* 452
DNA inversions in phages and bacteria, *by Pieter van de Putte and Nora Goosen* 457

Book Reviews

Techniques for the Analysis of Complex Genomes (Rakesh Anand), *by Michael Snyder* 462
The Dynamic Genome: Barbara McClintock's Ideas in the Century of Genetics (Nina Fedoroff and David Botstein, eds), *by Michael Freeling* 463

Author Index 465

Subject Index 469